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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/551,784	10/03/2005	Jong-Soo Back	27024U	5619
20529 7590 08/26/2010 THE NATH LAW GROUP 112 South West Street Alexandria, VA 22314				
EXAMINER EOM, ROBERT J				
ART UNIT		PAPER NUMBER		
1797				
MAIL DATE		DELIVERY MODE		
08/26/2010		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/551,784

**Applicant(s)**

BAEK ET AL.

**Examiner**

ROBERT EOM

**Art Unit**

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 July 2010.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 and 11-18 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-5 and 11-18 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO/SI.08)  
Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_  
5) ☐ Notice of Interval Patent Application  
6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 1-5 and 11-18 have been considered but are moot in view of the new ground(s) of rejection.

The applicant has amended independent claims 1 and 11 to positively recite and further define structural particulars regarding the claimed real-time monitoring apparatus, not previously presented, for consideration upon merits for patentability.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-5 and 11-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's Admitted Prior Art (referred herein as AAPA, see: Fig. 2 and Fig. 5), in view of De Maeyer et al. (USP 4,076,420, referred herein as Maeyer).

Regarding claims 1, 2, 17, and 18, AAPA discloses a real-time monitoring apparatus for biochemical reaction (**Fig. 2**) comprising: a temperature control block comprising a thermoelectric element (**2**) and a heat transmission block (**3**) which supply heat into a plurality of reaction tubes (**4**); a light irradiation source comprising a lamp with a first ellipsoidal reflecting mirror or a parabolic mirror (**5**) and a condensing lens (**17**); and an optical system comprising a receiving part (**12**).

AAPA does not explicitly disclose a rectangular or round optical waveguide or a focusing lens.

Maeyer teaches an apparatus for investigating fast chemical reactions by optical detection the light irradiation source comprising an optical waveguide (**Fig. 3**) comprising: a light source (**Q**) which provides light which is focused with a series of lenses (**L5 and L9**), passed through a monochromator (**M**), passed though a flexible light pipe (**G**), directed through a series of optics to the cell chamber (**K**), and then detected with a series of detectors (**D**). It would have been obvious to one having

ordinary skill in the art at the time of the invention to incorporate a focusing lens and waveguide into the monitoring apparatus of AAPA, as taught by Maeyer, since doing so provides for light from the light source to be fit to the shape of the entrance aperture of the sample cells **(C9/L31-34)**.

Regarding claim 3, modified AAPA discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the refractive index of medium of the optical waveguide is 1.35 ~ 2.0. As the phase velocity is a variable that can be modified by adjusting the said refractive index, with said phase velocity decreasing as the refractive index is increased, the precise refractive index would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed refractive index cannot be considered critical. Accordingly one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the refractive index of modified AAPA to obtain the desired phase velocity (In re Boesch, 617 F2D. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (In re Aller, 105 USPQ 223).

Regarding claims 4 and 5, modified AAPA discloses all of the claim limitations as set forth above. While, modified AAPA does not explicitly disclose the particular shape of the optical waveguide having a rectangular or round shape, Maeyer discloses that the rectangular cross section of the light may be transformed into a round one to

correspond to the shape of the sample cell entrance aperture (**C9/L31-34**). Therefore, it would have been obvious to one having ordinary skill in the art at the time of the invention to select the appropriately shaped waveguide (circular, rectangular, etc.) to provide for a light cross section which corresponds to the cross section of the aperture of the sample cell, whether round or rectangular.

Regarding claims 11-13 AAPA discloses a real-time monitoring apparatus for biochemical reaction (**Fig. 2**) comprising: a temperature control block comprising a thermoelectric element (**2**) and a heat transmission block (**3**) which supply heat into a plurality of reaction tubes (**4**); a light irradiation source comprising a lamp with a first ellipsoidal reflecting mirror or a parabolic mirror (**5**) and a condensing lens (**17**); and an optical system comprising a receiving part (**12**) and two or more second reflecting mirrors (**18**).

AAPA does not explicitly disclose a rectangular or round optical waveguide or a focusing lens.

Maeyer teaches an apparatus for investigating fast chemical reactions by optical detection the light irradiation source comprising an optical waveguide (**Fig. 3**) comprising: a light source (**Q**) which provides light which is focused with a series of lenses (**L5 and L9**), passed through a monochromator (**M**), passed through a flexible light pipe (**G**), directed through a series of optics to the cell chamber (**K**), and then detected with a series of detectors (**D**). It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate a focusing lens and

waveguide into the monitoring apparatus of AAPA, as taught by Maeyer, since doing so provides for light from the light source to be fit to the shape of the entrance aperture of the sample cells **(C9/L31-34)**.

Regarding claim 14, modified AAPA discloses all of the claim limitations as set forth above, but the reference does not explicitly disclose the refractive index of medium of the optical waveguide is 1.35 ~ 2.0. As the phase velocity is a variable that can be modified by adjusting the said refractive index, with said phase velocity decreasing as the refractive index is increased, the precise refractive index would have been considered a result effective variable by one having ordinary skill in the art at the time the invention was made. As such, without showing unexpected results, the claimed refractive index cannot be considered critical. Accordingly one of ordinary skill in the art at the time the invention was made would have optimized, by routine experimentation, the refractive index of modified AAPA to obtain the desired phase velocity (In re Boesch, 617 F2D. 272, 205 USPQ 215 (CCPA 1980)), since it has been held that where the general conditions of the claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art (In re Aller, 105 USPQ 223).

Regarding claims 15 and 16, modified AAPA discloses all of the claim limitations as set forth above. While, modified AAPA does not explicitly disclose the particular shape of the optical waveguide having a rectangular or round shape, Maeyer discloses that the rectangular cross section of the light may be transformed into a round one to correspond to the shape of the sample cell entrance aperture **(C9/L31-34)**. Therefore, it

would have been obvious to one having ordinary skill in the art at the time of the invention to select the appropriately shaped waveguide (circular, rectangular, etc.) to provide for a light cross section which corresponds to the cross section of the aperture of the sample cell, whether round or rectangular.

### ***Conclusion***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT EOM whose telephone number is (571)270-7075. The examiner can normally be reached on Mon.-Thur., 9:00am-5:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony G Soohoo/  
Primary Examiner, Art Unit 1797

/R. E./  
Examiner, Art Unit 1797